



A Case of Babesiosis in an Immunocompromised Host Requiring Exchange Transfusion

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BACKGROUND

- Babesiosis is caused by protozoan organisms from the *Babesia* genus¹. This case was caused by the species *Babesia microti*, which is the most common type of *Babesia* parasite found in North America².
- *B. microti* is an endemic organism in the United States, specifically the region of New England and northern Midwest. The parasite spreads via black-legged or deer ticks, also known as *Ixodes scapularis*².
- Diagnosis is typically made via blood smear with the visualization of characteristic U-shaped parasitic rings within the red blood cells consistent with *Babesia*³⁻⁴.
- Common symptoms of babesiosis include fever, headaches, fatigue, chills, cough, sweats, arthralgia, nausea, and myalgia⁵.

PRESENTATION

- A 69-year-old male with a past medical history significant for traumatic splenic rupture requiring splenectomy presented with a 1-week history of worsening fatigue, recurrent fevers, a 1-2 day history of bilateral scleral icterus, and one episode of diarrhea.
- His social history was notable for his recent travel to Vermont for a hiking trip.
- Further laboratory work-up showed a leukocytosis to 14.24 K/uL, anemia to 9.7 g/dL, and thrombocytopenia to 105 K/uL. His total bilirubin was elevated at 2.0 mg/dL.
- Imaging included a chest radiograph that showed a mildly enlarged cardiac silhouette and mild partial atelectasis of the lung bases bilaterally.

RESULTS & FOLLOW-UP

- A peripheral blood smear was performed which demonstrated intracellular red cell inclusions and extracellular microorganisms consistent with *Babesia*, and a parasite load of approximately 15%.
- His babesia IgG level was 1:512, with IgM level of 1:320 and *babesia* DNA was detected.
- His infectious work-up including Lyme, HIV, and blood cultures was otherwise negative.
- Based on the patient's fevers, chills, extreme exhaustion, transaminitis, neutrophilic leukocytosis, and findings of *babesia* on peripheral smear, he was diagnosed with sepsis secondary to babesiosis and started on atovaquone, doxycycline, and azithromycin.
- A repeat chest radiograph was obtained, as the patient began experiencing increased shortness of breath after day 3 of his admission. It showed mild pulmonary edema and demonstrated bibasilar airspace disease, which was thought to represent alveolar edema or developing infection. His maximum parasite load peaked at 19.3% (**Figure 1**).
- His elevated parasite load and findings of lung complications provided an indication for an exchange transfusion, which he tolerated well.
- Peripheral smears were trended daily to monitor parasite load, which improved to 0.9% on the day of discharge. He was discharged on atovaquone and azithromycin, with outpatient follow-up for weekly smears and monitoring of improving symptoms.

DISCUSSION

Standard medical management for babesiosis includes administration of atovaquone and azithromycin. Red blood cell exchange transfusion is rarely utilized except for in severe cases⁷. Our patient's risk factors for developing severe disease with babesiosis were his history of asplenia and age over 50 years⁷. Current clinical recommendations include consideration of exchange transfusion for patients with parasitemia greater than 10% or less than 10% but with the presence of signs of hemolytic anemia, pulmonary, renal, or hepatic involvement⁶. Exchange transfusion should be performed early to reduce the severity of infection and can be a life-saving intervention as it reduces parasite load, treats the presence of anemia, and decreases pro-inflammatory cytokines⁷. Although red cell exchange transfusion has proven to be an effective treatment option in a series of case reports, future research can be aimed at larger studies either retrospective or prospective to further validate these individualized findings.

CONCLUSIONS

- Although babesiosis is mostly asymptomatic in individuals, a thorough history and close clinical monitoring of patients is critical for the worsening or development of new symptoms despite improving parasite load.
- Immunocompromised individuals and the elderly are at an increased risk of needing exchange transfusion and developing pulmonary complications during *Babesia* infection.

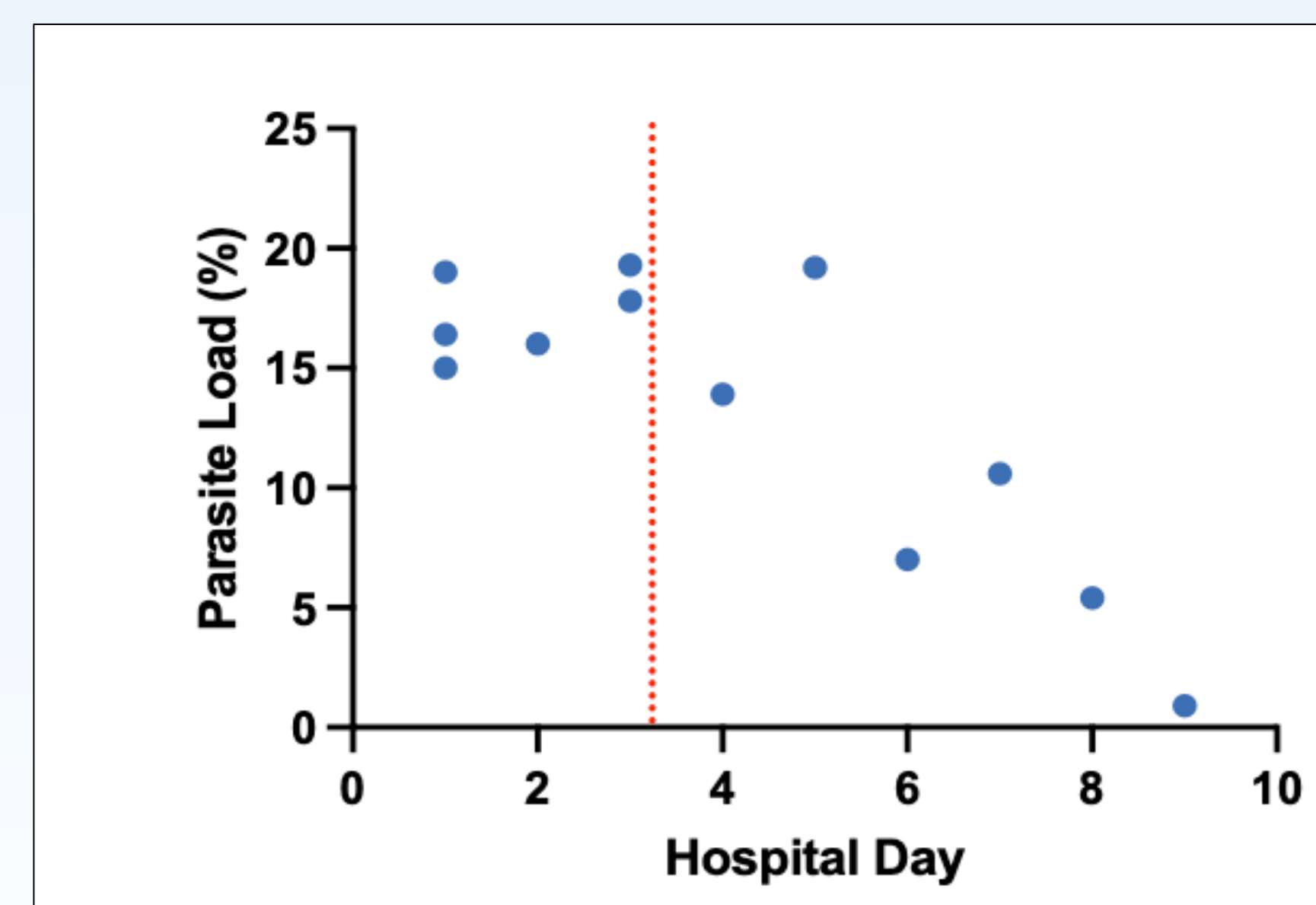


Figure 1. Changes in parasite load as measured by serial peripheral blood smears. Peak was 19.3% on hospital day 3, with red dotted line indicating day of exchange transfusion. On hospital day 5, parasite load increased to 19.2% but subsequently improved to 0.9% by day of discharge.

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